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DISEASES OF THE NERVOUS SYSTEM

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

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DISEASES of the NERVOUS SYSTEM

(PUBLISHED MONTHLY)

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

Electroencephalogram Associated With Post-traumatic Headaches (in patients with Skull Defects)

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What is the incidence of electroencephalographic abnormality in patients who have suffered head injury with resulting skull defects and thereafter complain of headache? Is there any characteristic electroencephalographic finding in these patients? Is there any relationship between the severity of the headache and the degree of cortical dysrhythmia? An attempt to answer these and other questions is the purpose of this study.

Investigators have published reports of the electroencephalographic findings in post-traumatic states but nearly all their studies include a wide range of cerebral injuries. For instance, Williams[1] reports his findings in 325 patients with head injury but notes that the study "included patients with injuries, trivial and severe, as remote as 12 years before the examination." He found that 162 (50%) had abnormal electroencephalograms. Greenblatt[2] reviewed 263 patients in which "head trauma had been sustained anywhere from weeks to years before the EEG study was done." He found that 48% had definite abnormal recordings and 20% had borderline recordings. His study included 94 patients suffering primarily from headache; of these, 33% had abnormal records. It is obvious that the percentage of cortical dysrhythmia in those complaining of headache was smaller than the average percentage of abnormality in the post-traumatic group which was 48%. This suggests that the presence of the post-traumatic headache decreases the possibility of electrical cortical disturbance. In contrast to Greenblatt's findings, Jasper[3] and co-workers found that in 31 post-traumatic cases whose complaints "consisted chiefly of headache, dizziness and nausea," 27 or approximately 87% had cortical dysrhythmias.

Material and Method

Of 116 enlisted men and officers with skull defects referred by the neurosurgical service to the electroencephalograph laboratory for examination prior to cranioplasty, 91 (78.5%) had evidence of cortical dysrhythmia. Thirteen (11.2%) of these patients were believed to have moderate disturbances while the majority were classified as severely disturbed. In the report of the Publications Board of the Army and Navy Departments by Alexander[4] concerning the electroencephalographic studies in wartime Germany, reference is made to the work of Kornmuller in open injuries of the head resulting from gunshot. The number of patients studied is not given but he is said to have found 13% normal, 37% slightly abnormal and 50% definitely abnormal.

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TABLE I.

ETIOLOGY OF THE SKULL DEFECTS

Patients with dysrhythmic electroencephalograms

COMBAT INCURRED

Small arms fire	17
Shell or bomb fragment	53
Grenade fragment	8
Japanese saber wound	1
Half-track accident	1
Jeep accident	1
Unknown	3

NON-COMBAT

Baseball bat	1
Beer bottle	1
Jeep accident	2
Auto accident	2
Fall from telephone pole	1
	91

Patients with normal electroencephalograms

COMBAT INCURRED

Small arms fire	9
Shell or bomb fragment	10
Tank accident	1
Unknown	1

NON-COMBAT

Fall from train	1
Truck accident	1
Jeep accident	1
Monkey wrench	1
	25

No attempt was made to confine the study to combat casualties. (Table I.) Many of the injuries were not incurred in the line of duty. The average age at the time of examination was 25 years, the youngest being 19 years and the oldest, 36. The average interval between the date of injury and the EEG examination was 167 days; 21 days was the shortest interval and 1,034, the longest; the next longest interval was 485 days. Comparison of the average intervening period in patients with normal electroencephalograms to those with dysrhythmic tracings reveals no significant difference. In spite of the presence of bony defects in all patients, a surprisingly large number escaped dural penetration. (Fig. 1.) Thirteen (11%) patients did not sustain opening of the dura at the time of injury. Ninety-six patients were rendered unconscious when injured and 92 had pathological neurological signs at the time of EEG examination.

Fig. 1. Patients with skull defects; Comparison of number that: (I) suffered dural penetration at the time of injury, (II) No dural penetration, (III) Unconsciousness following injury, (IV) No history of unconsciousness, (V) Positive neurological findings at the time of EEG, (VI) Negative neurological findings.

The Standard Army Recording Technique[5] providing for eight cortical leads and two indifferent interconnecting leads attached to the ear lobes was employed. In addition to the routine placement of electrodes, numerous additional electrodes, obviously necessary for accurate localization were freely used. The standard technique primarily utilized the monopolar system but bipolar recordings were also made. Standard Army Technique stipulates that a patient overventilate for two minutes at a rate of fifty breaths per minute. The limitation of overventilation is unsatisfactory and was not sufficient to produce evidence of latent focal activity. Minimum recording time was 24 minutes, the longest examination required 51 minutes. All sedative and anti-convulsive medication was withdrawn from the patient 72 hours prior to EEG examination. No patients were unconscious at the time of the examination.

The system of electroencephalographic classification developed by Gibbs and Lennox[6] was generally adopted with a single minor deviation. Gibbs separates the dysrhythmic recordings into two large divisions, focal and non-focal. Because of the frequency of bilaterally synchronous disturbances, it was found more convenient to use

Jasper's[7] terminology, that is, the qualifying words "bilateral synchrony" and "diffuse," in addition to "focal." Therefore, the types of abnormal wave forms and frequencies were described as Diffuse, (D); Bilateral Synchrony, (B); and Focal, (F). It was frequently necessary to combine these three qualifications. The 91 recordings which were considered disturbed were placed into five groups: Diffuse, 37; Bilateral Synchrony, 11; Diffuse and Bilateral Synchronous, 6; Focal, 8; and Diffuse and Focal, 29. (Fig. 2.) A brief summary of the Gibbs Classification follows: A rate of 8½ to 12 per second waves and low voltage fast activity are considered normal. The letter "S" represents slow activity and "F" fast activity. S-1 and F-1 are considered moderately slow and fast respectively. S-2, S-3 and F-2 are considered very abnormal. There are five types which occur as paroxysmal activity only and are considered definitely suggestive of epilepsy. These are Petit Mal Variant (P.M. V.), Petit Mal (P.M.), Psychomotor (Psy.), Spikes (Sp.), and Grand Mal (G.M.). Slow activity may also occur in bursts. Amplitude asymmetry is designated Asym.

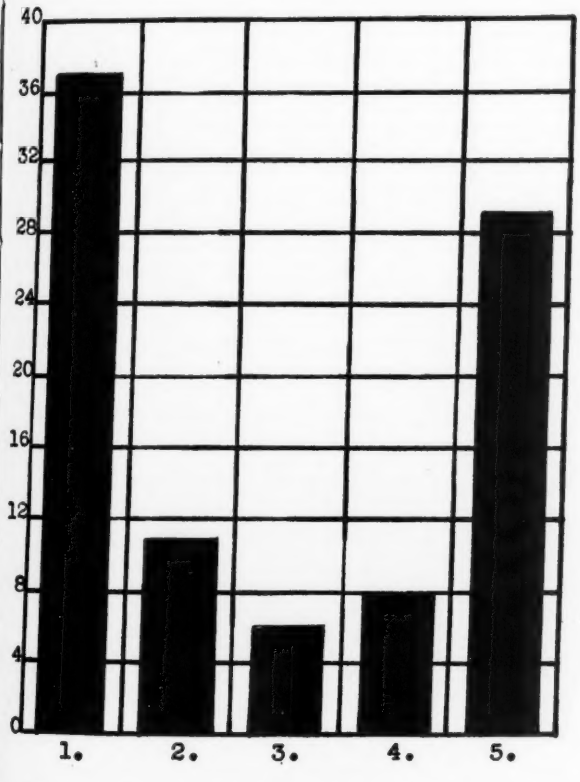


Fig. 2. Number of abnormal EEG's according to cortical distribution. (1) Diffuse dysrhythmia, (2) Bilateral synchrony, (3) Diffuse and bilateral synchrony, (4) Focal and (5) Diffuse and focal dysrhythmias.

The abnormal electroencephalograms included many slow waves as well as fast waves, spikes and psychomotor activity. Paroxysmal activity occurs in only eight records. It was interesting to observe the complete absence of the so-called petit mal and grand mal types of dysrhythmias. The infrequency of a three per second spike and wave in post-traumatic conditions has been commented upon by Denny Brown[2] and Denis Williams.[1]

Thirteen patients developed post-traumatic epilepsy (Table II). Twelve patients suffered from major seizures, three of the patients (Patients 4, 5 and 8, Table II) had seizures initiated by Jacksonian spread. One patient (Patient 1), developed seizures which consisted of clonic movements of the right upper and lower limbs with aphonia, without loss of consciousness. These attacks were of brief duration. These four patients showed focal abnormalities on electroencephalographic examination. All of these patients showed some evidence of disturbed electrical cortical activity. Five had paroxysmal disturbances.

TABLE II.

PATIENTS WITH POST-TRAUMATIC EPILEPSY

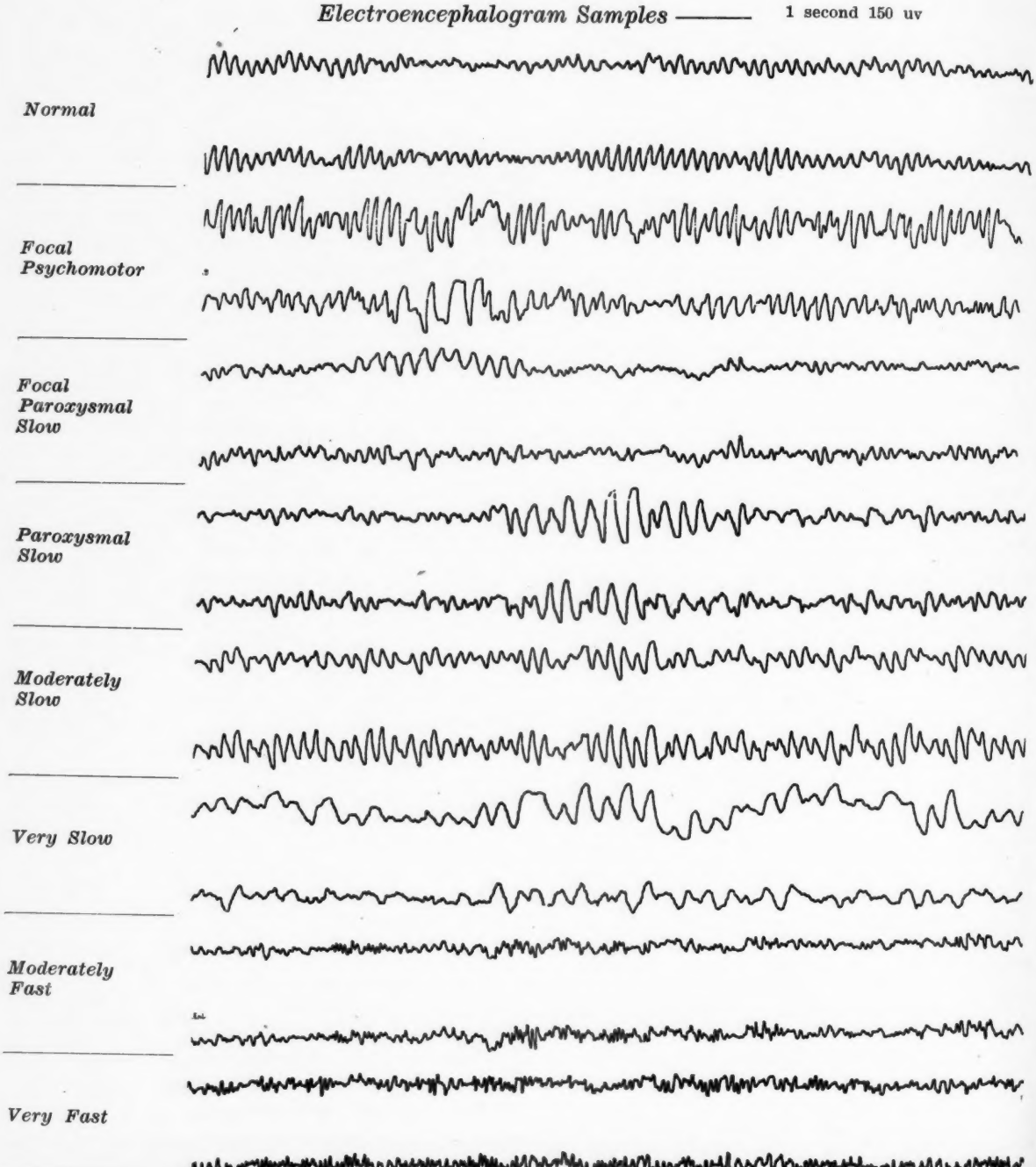
Patient	Type of EEG	No. days between date of injury and EEG	Age
	Focal		
1	Paroxysmal	167	32
	S-2		
	Paroxysmal		
2	S-2 (D)	119	19
	(D) S-2 & (D)		
3	Psychomotor	212	30
	(D) S-2 & (F)		
4	Psychomotor	127	29
	(D) S-2 & (F)		
5	Spikes	173	21
6	(D) S-2 & F-2	1034	36
7.	(D) S-2 & (F)		
	S-2	214	22
	(D) S-2 & (F)		
8	S-3	27	30
	(D) S-1 & (F)		
9	S-2	347	22
10	(D) S-1	133	26
11	(D) S-2	115	22
12	Asymmetry	281	24
	(D) S-2 & (F)		
13	F-2	143	30

(D) *Diffuse;* (B) *Bilateral Synchronous;* (F) *Focal.*

Results

In the series of 116 patients with skull defects of traumatic origin, 67 patients complained of post-traumatic headache. Approximately 60% claimed that headache was present during the first electroencephalographic examination. Many had a second examination while they were free of this complaint and, there was no evidence of alteration in the cortical activity.

The patients gave a varied history as to the date of onset of their head pain. Some soldiers experienced the first headache within a few days of the injury while others had no headache until several weeks after the cerebral trauma. There was no evidence that time of onset was reflected in the electroencephalographic findings. Many patients related that they were free of headache upon awakening in the morning but the head pain would become manifest within a short time after arising from bed. In 51 cases (76%)



the complaints of headache could be best classified as diffuse and sixteen (24%) had localized pain. When the pain was confined to a definite area of the head it was, without exception, the point of cranial penetration or skull defect. The headaches were not localized in any case to the region of retained intracranial foreign bodies. The patients frequently complained that their pain was aggravated by stooping, coughing or straining. Many patients also complained of recurrent spells of dizziness or a feeling of light-headedness.

The severity of the complaints is a factor of importance. In the series studied the 67 patients suffering from headache were divided into three categories according to the intensity of their complaints. It is admitted that it is extremely difficult to evaluate such a subjective complaint in different individuals. The placing of the patients in the three categories was determined by the frequency of the headache, its duration and the amount of pain described during the episode of headache. In this classification 33 (49%) patients had severe headaches, 19 (28.5%) moderate and 15 (22.5%) were considered to be mild.

Electroencephalographic examination revealed that 53 (79%) of those patients with post-traumatic headache had cortical dysrhythmia; 14 (21%) had electroencephalograms that were considered to be within normal limits. Of the 33 patients with severe headache, 30 had very disturbed electroencephalograms, one was moderately dysrhythmic and two were without evidence of abnormal cortical activity. Twelve patients had severely disturbed electroencephalograms in the group of 19 with moderate headache. Five of the remaining seven were normal. Seven of the 15 patients with mild headache had normal EEG's, five were characterized by moderate abnormalities and two were very disturbed. Figure 4 reveals that there is little variation in the severity of the headaches in patients with normal and moderately dysrhythmic electroencephalograms. However, there was a prepon-

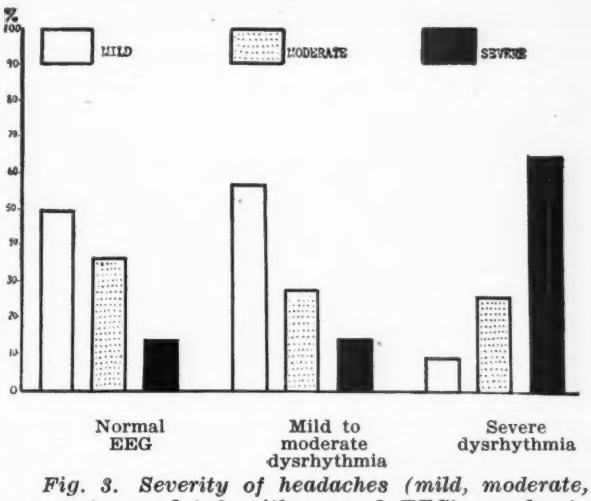


Fig. 3. Severity of headaches (mild, moderate, severe) correlated with normal EEG's, moderate and severe EEG abnormalities.

TABLE III.

DURATION OF UNCONSCIOUSNESS AS RELATED TO CORTICAL DYSRHYTHMIA AND THE COMPLAINT OF HEADACHE

	Group I	Group II	Group III	Group IV	Total No.
116 Patients with skull defects of Traumatic Origin	20 (17.2%)	28 (24.1%)	63 (54.3%)	5 (4.3%)	116
Patients with cortical dysrhythmia	11 (12.1%)	21 (23.1%)	54 (59.3%)	5 (5.5%)	91
Patients with normal EEG's	9 (36.0%)	7 (28.0%)	9 (36.0%)	0	25
Patients with headache and dysrhythmia	7 (13.2%)	7 (13.2%)	34 (64.1%)	5 (9.4%)	53
Patients with headache and normal EEG's	7 (50.0%)	4 (28.5%)	3 (21.5%)	0	14

GROUP I—No history of Unconsciousness.
GROUP II—Unconscious less than thirty minutes.
GROUP III—Unconscious thirty minutes to forty-eight hours.
GROUP IV—Unconscious forty-eight hours to twenty-eight days.

derance of severe headaches in those patients with marked electroencephalographic changes.

Williams[1] noted the correlation between the duration of post-traumatic amnesia, the degree of cerebral damage and the persistence of abnormality in the electroencephalogram. Unfortunately, it was practically impossible for us to make a reliable estimation of the duration of amnesia. The patient's return to the point of dependable memory was all too often gradual and usually "spotty." Another important complication was the frequency of aphasia which also interfered with evaluation of the duration of amnesia. Therefore, the duration of unconsciousness which could be obtained fairly accurately from the clinical records was studied as to its correlation with the electroencephalographic changes and the complaint of headache. The first step was to divide the 116 patients into four groups: Group 1 was composed of 20 patients without a history of unconsciousness; Group 2 included 28 patients who were unconscious less than 30 minutes; Group 3, which was by far the largest, was made up of 63 patients who were unconscious from 30 minutes to 48 hours; Group 4, were those unconscious for longer than 48 hours, there were only five soldiers in this group.

A comparison of the patients with normal and dysrhythmic electroencephalograms is shown in Table III. It is clear that all five of the patients in Group four had cortical disturbances and that the percentage of abnormal electroencephalograms in Group 3 is much greater than those with normal tracings. Of those with headache and cortical dysrhythmia, seven were in group I and, therefore, did not lose consciousness. Seven were unconscious less than 30 minutes, 34 were unconscious 30 minutes to forty-eight hours and five were unconscious longer than 48 hours (group 4). Of those patients with headache but without dysrhythmia, seven were in Group I, four in Group 2, and three in Group 3. It appears that there is some correlation involving duration of unconsciousness, cortical electrical abnormalities and post-traumatic headache. It is also of interest to note that all five of the patients that were unconscious longer than 48 hours had very abnormal electroencephalograms, as well as severe post-traumatic headaches and that almost 80% of those with severe headache were unconscious 30 minutes or more.

As previously mentioned, the various types of electroencephalographic abnormalities as to wave form and frequency were qualified as to cerebral distribution of the abnormality. A total of 37 patients were found to have a diffuse cerebral disturbance, 58% of these patients suffered from headache; of those with bilaterally synchronous abnormality, 64% had similar complaints. Among those with diffuse dysrhythmias as well as a more serious bilateral synchronous change, 50% complained of headache. Diffuse and focal electroencephalograms were accompanied by headache in 51% but in those 8 patients with only focal abnormal waves, 7 or 88% complained of headache. This unusually high percentage is of doubtful significance in as much as a similar percentage is not found in those patients with focal and diffuse upsets.

The types of abnormal cortical activity as to wave form and frequency were also tabulated and compared. It was clearly evident that the slow waves are the most common of the various abnormalities. Flat-topped slow waves or psychomotor activity were the only type of paroxysmal activity which were present in those patients complaining of headache. Fast waves and pattern asymmetry were also present in patients with headaches as well as those without. The occurrence percentage was not sufficiently high in any specific type of abnormality to suggest that any definite type of waves are found in patients with headache which would set them apart from patients who have suffered head injury but escaped the sequelae of headache. It must be kept in mind that slow activity is the most common type of abnormal electroencephalographic findings in all types of organic brain pathology.

Of the total of 116, 103 patients suffered dural opening at the time of injury, 81% of these patients developed dysrhythmias. 13 patients escaped dural penetration, 8 (61%)

developed electroencephalographic abnormalities. It appears that dural penetration or opening does increase the possibility of electroencephalographic abnormality. However, the history of dural opening does not seem to increase the possibility of headache. Of the patients with post-traumatic headache 86.8% suffered dural penetration while 91.8% had dural opening in those patients without headache.

The presence on physical examination of abnormal neurological signs is always accepted as definite evidence which indicates pathological involvement of the nervous system. Of the 91 patients with dysrhythmic tracings, 69 (75.8%) had positive pathological findings and 44 (63%) of the 69 complained of headache. Twenty-five patients had normal tracings, seven (28%) had positive findings and four (57%) of the seven complained of headache. These facts demonstrated that it is possible for a patient with post-trauma headache and positive neurological findings to show no evidence of cortical dysrhythmia by electroencephalographic examination.

Eight of the 13 patients with symptomatic seizures complained of headache. Six were Diffuse and two were Focal but the Focal complaints of headache were not present in those with Jacksonian seizures. All the epileptics had suffered dural penetration at the time of their injury. This incidence of seizures may be misleading and it is possible that additional patients will develop convulsive complaints. In an analysis of British war prisoners, Ashcroft found that epilepsy was twice as frequent (45%), in cases where the dura was penetrated by gunshot wounds as in scalp wounds with intact dura (23%).

Comparison of the percentage of disturbed electroencephalograms among those patients with skull defects without headache to those with headache is of definite clinical interest. In patients with headache 79.1% were disturbed, 77.5% in those free of headache, and when the two groups are combined the percentage is 78.5%. These figures indicate that if a patient suffers a severe head injury with a resulting skull defect the presence or absence of headache does not alter his chances of having a disturbed electroencephalogram. (Fig. 4.)

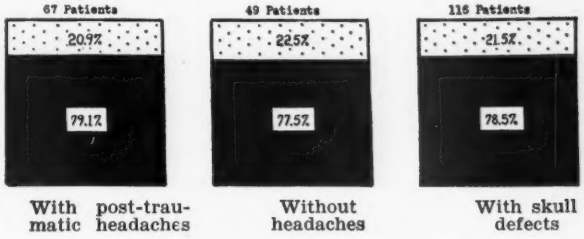


Fig. 4. Percentage of normal (stippled area) and disturbed electroencephalograms.

Comment

The author wishes to make clear that he is not of the opinion that abnormal electrical cortical activity plays any important role in the productive mechanism which results in the patient's complaint of headache. Wolff has clearly demonstrated that certain head structures are sensitive to pain while others are not. Wolff[9] states, "The cranium, the parenchyma of the brain, most of the dura, most of the arachnoid, the ependymal lining of the ventricles and the choroid plexuses are not sensitive to pain." The electroencephalogram is a measurement of the pathological involvement of the parenchyma which is one of the structures insensitive to pain. Wolff believes that headaches are chiefly caused by "traction, displacement, distention and inflammation of cranial vascular structures."

Pennfield and Narcoss[10] agree with Wolff and have presented a very logical explanation as to the pathological mechanism of some post-traumatic headaches. They believe that following trauma, adhesions form between the dura and the arachnoid. Tension of the adhesions will in turn exert traction on the surface vessels of the brain producing pain by a stretch mechanism. In consideration of these explanations of the pathological mechanism of headache, it is conceivable that a patient may justifiably complain of headache and at the same time show no evidence of abnormal functioning of the non-pain-sensitive cortical cells. Therefore, the clinical value of the electroencephalogram is limited by the fact that it is a measurement of parenchymal cell functioning while the headaches are the result of pathology which cannot be measured by the same means.

The possibility of psychogenic coloring in the patient's complaints of headache was not ignored and admittedly was extremely difficult to evaluate. The majority of these patients demonstrated anxiety symptoms and especially expressed fear and doubt concerning their future. They were aware of the seriousness of their injuries. Many were fearful of developing symptomatic seizures. It is probable that psychogenic coloring was present but none of the patients were believed to present the clinical picture which would warrant the diagnosis of psychogenic headache.

Summary and Conclusions

The electroencephalograms of a group of one hundred and sixteen patients with skull defects of traumatic origin were studied to determine the relationship of electroencephalographic abnormalities and the complaint of post-traumatic headache. Ninety-one patients showed evidence of cortical dysrhythmia and 67 complained of headache.

(1) Of the 67 patients with post-traumatic headache, 53 had disturbed electroencephalograms. Therefore, we can say that the electroencephalograph, in approximately 80% of those patients with headache, will offer confirmatory evidence that the symptoms are the result of the head injury.

(2) Dural penetration definitely increases the number of disturbed electroencephalograms but does not increase the chances of post-traumatic headache as a sequelae.

(3) There is an apparent correlation between the degree of cortical dysrhythmia and severe head pain. Of those patients with normal tracings, 7.15% had severe headache, of those with moderately disturbed rhythms, 14.3% had severe headache and when the electroencephalogram was badly disturbed, 65.2% had severe headache.

(4) A prolonged period of unconsciousness at the time of injury increases the possibility of cortical dysrhythmia and the complaint of post-traumatic headache.

(5) Slow waves were the most common abnormal waves encountered. The absence of spike and wave (petit mal) and the so-called grand mal activity is believed significant. It confirms the belief that petit mal waves are rarely, if ever, found in post-traumatic conditions and suggests that the same is true of grand mal activity.

(6) A patient may be suffering from post-traumatic headache and have both a normal electroencephalogram and negative neurological findings.

(7) The symptom of post-traumatic headache does not increase the likelihood of a dysrhythmic electroencephalogram in patients who have suffered head injury with resulting skull defects.

AUTHOR'S NOTE: This study was carried out at a U. S. Army Neurosurgical-Neuropsychiatric Center (McCloskey General Hospital, Temple, Texas) during the period from January 1944 to December, 1945.

REFERENCES

1. Williams, Denis, The Electroencephalograph and Chronic Post-Traumatic State. *J. of Neur. and Psychiatry,* 4:131-146, 1941.
2. Greenblatt, Milton, The Electroencephalogram in Late Post-Traumatic Cases. *Am. J. of Psychiatry,* November 1943. Pages 378-386.
3. Jasper H. H., Kershman, J. and Elvidge, A., Electroencephalography in Head Injury. *Research Nerv. & Ment. Dis. Proc.* (1943), 24:380-420, 1945.
4. Alexander, Leo, Neuropathology and Neurophysiology, Including Electroencephalography in Germany. *Report No. 359.*
5. War Department Technical Bulletin 74, Electroencephalography: Opreative Technique and Interpretation. *War Department,* Washington 25, D.C., 22 July, 1944.
6. Gibbs Gibbs and Lennox, Electroencephalographic Classification of Epileptic Patients and Control Subjects. *Archives of Neur. and Psychiatry.* 50:111-127, 1943.
7. Jasper, Herbert, "Epilepsy and Cerebral Localization," Chapter XIV, by Penfield and Erickson, *Charles C. Thomas Company,* Springfield, Illinois, 1941.
8. Denny, Brown D., The Clinical Aspects of Traumatic Epilepsy, *Am. J. of Psychiatry,* Vol. 100, No. 5: March, 1944.
9. Wolff, Harold G., Headache Mechanisms. *J. of Nerv. and Ment. Dis.,* Vol. 94:466-474, Society Proceedings, Boston Society of Psy. and Nerv.
10. Penfield, W. and Narcoss, N. C., Subdural Traction and Post-Traumatic Headache. Study of Pathology and Therapeusis. *Arch. Neurol. and Psychiat.,* 36:75-95, July, 1936.

An Inventory of the Common Factors in the Methods of Modern Psychotherapy

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Chicago, Ill.

PART I.

Modern psychotherapy is far from being an integrated and commonly accepted discipline. It is split into different schools which are based upon dissenting theories and use various methods of treatment. Analytic, suggestive and pedagogic procedures are employed. Each group claims to possess the only correct key to the understanding and clearing of neurotic problems. For years the followers of the different doctrines spent much time in fighting each other in factious disputes. However, there are indications that narrow dogmatic views are being abandoned, and it is to be hoped that a common basis may be found with respect to generally accepted principles and procedures.

The latest publication of the Chicago Institute for Psychoanalysis departs widely from the orthodox postulates of traditional psychoanalysis. The authors of "Psychoanalytic Therapy" advocate a greater flexibility in the technical procedure, recommending even brief "off-the-couch" interviews of a more direct character, which they formerly derided as superficial and unqualified, and they also revise some fundamental Freudian concepts.

The urgent need in wartime for quick help to large numbers of psychoneurotic soldiers encouraged the revival of old and prompted devices of new forms of treatment, as described in Grinker and Spiegel's classical book "Men Under Stress." Narcohypnosis and narcoanalysis, as used in the British Army, are nothing but drug-induced suggestive and cathartic hypnosis, whereas Grinker's narcosynthesis tends to enable the patient to re-live and to abreact the traumatic situation, but, at the same time, to synthesize the stirred-up material.

In an attempt to evaluate the various psychotherapeutic methods I have always been impressed by the observation that the therapeutic results obtained by therapists of different shades seemed to be about equal in comparable cases. In view of this appraisal we are tempted to conclude that the choice of method may be, after all, less decisive than commonly assumed. Either our patients are astonishingly adaptable to our different and sometimes rather strange procedures, or very similar principles must be active in all methods.

Indeed, the important role which the patient himself plays in the treatment, cannot be overrated. A neurotic who makes up his mind to see a psychiatrist, often after a long internal struggle, has already taken an essential step towards recovery by himself. He has realized the neurotic nature of his complaints, is prepared to lay bare the roots of his problems, and is willing to correct his attitude. The course of the treatment is largely determined by the material he brings forth, his narrative, his recollections and dreams. During an interview the patient often picks out from our conversation merely that which he bears in his own mind, and he not rarely seizes the initiative. The arbitrary behavior of some of our patients is illustrated by the following example:

A timid and withdrawn young nurse, suffering from severe asthma and phobias, was willing to submit to psychotherapy only under the condition that neither psychoanalysis nor any form of suggestive treatment, especially hypnosis, would be applied. I agreed, and confined myself to a series of exploratory interviews. After the fifth treatment the patient declared that now having gained confidence, she would not mind being hypnotized. I refused, referring to our initial agreement. During the next interview the patient suddenly closed her eyes and, with a loud cry, fell into a state of deep self-hypnosis, without, however, losing the rapport with me. She revealed the basic conflict with her mother in a dramatic outburst of anxieties and aggressions. After this catharsis a true transformation of personality took place. The once inhibited,

*Read before the December 1946 meeting of the Illinois Psychiatric Society.

seclusive and depressed girl became a cheerful, active and sociable person, she gave up nursing and married.

Even in a common hypnosis the patient is not entirely passive and completely dependent upon the suggestions of the hypnotist. If the patient is not prepared to become freed from his neurosis, he would accept only the circumstantial, but not the essential suggestions. He may sleep deeply, and even snore, but he need not give up one neurotic symptom. He is also able to interpret the suggestions to some extent.

A patient, suffering from urinary trouble, told me after several hypnotic treatments, that nothing had changed so far with his bladder, but that another complaint, unknown to me, an inveterate eczema of his thigh, which had resisted every treatment for ten years, had suddenly disappeared.

It was Coue with his teaching of autosuggestion who most strongly emphasized that the real healing power lies with the patient and not with the therapist. In fact, the patient must accomplish the main work, while the therapist's task consists of instructing the patient how to use his own faculties, and of leading him safely through the maze of neurotic symptoms and tricks.

However, opinions differ as to the extent to which the therapist should actively interfere in the treatment. In traditional analysis the analyst is expected to be passive, reserved and reticent, following Freud's advice:

"The analyst must behave like the surface of a well polished mirror—a lifeless thing." But apart from the fact that many analysts have now adopted a more active conduct, even the most passive analyst cannot help influencing the analytic situation by his special technique, his selection of the material, and the form and content of his interpretations. On the other hand, in brief analysis and other forms of condensed psychotherapy there is the danger of a too active interference on the part of the therapist. The patient must be given the opportunity to develop his self-analysis. Premature conclusions and anticipated solutions, correct as they may be, jeopardize the whole cure. However, timely directions, certain psychological explanations and cautious suggestions are apt to promote the therapeutic process, and an occasional concise review of the acquired material and an outlining of the essential problems help to avoid detours. Everything depends on the tact and experience of the therapist.

With regard to the important question of interpretations we must realize that the interpretations given by different schools have more in common than appears on the surface. Every sect has coined its own terminology. Adler's inferiority complex parallels Freud's castration complex, and Freud's penis envy corresponds with Adler's masculine protest. Moreover, some so-called interpretations are not causal explanations, but solely descriptions of certain phenomena in the wording of a special school.

In an analytic paper, e.g., in which the author refers to an autobiography of the poet Housman, he translates a sentence of the poet into analytic language:

The words of the poet are: "I have rarely written poetry unless I was out of health, and this experience, though pleasurable, was generally agitating and exhausting."

This passage is interpreted by the analyst in the following way:

"The path clearly leads from anal activity to homosexual passivity, and thus another well-known meaning of creation is evoked—that of giving birth to a child."

Certainly, the wealth of human imagination and the abundance of symbols, metaphors and similes in our language enables us to use various images to clarify (or to obscure) the same thing. However, we should not lose sight of the fact that some thoughts, expressions and actions retain, after all, their real meaning. Some psychologists go too far in interpreting and symbolizing, with the result that everything means something else, that nearly everything represents a sexual symbol, except, of course, the sexual intercourse itself, which, in turn, stands for something else. Fortunately, most of our patients do not take our interpretations too literally.

An indication of the correctness of our interpretations may be given by the fact that they are accepted and confirmed by the patient, who even may react with a visible sign of relief. However, we should not overrate the significance of this reaction.

A 50 year old school principal, happily married, father of three children, and without manifestations of homosexual tendencies, felt compelled to look at the genital region of men, especially of older men with an air of authority. Being afraid to offend with his looks, he would suddenly leave a conference, when he met there older men of this type. Sometimes, he felt the same compulsion towards women.

Following treatment by an orthodox analyst he was much relieved, when it was brought out that, at the age of three, he had been present when an uncle passed urine. Another recollection seemed to be of similar importance: at the age of five, he had seen his father in the bath, and had been frightened by the sight of his big genitals; his father suffered from a hydrocele. The analyst assumed presence of latent homosexuality and castration complex. Again a period of improvement.

After 18 months of treatment the analyst left town, and the patient came to me. In the course of a character analysis his views regarding the problem of authority, his attitude towards social, political and religious questions were discussed. He came from an old Prussian conservative family. He himself, however, was progressive, liberal, free-thinking, and opposed to authoritative and old-fashioned concepts. He liked his profession as a teacher, but disliked his position as a principal. He took pains to avoid an imperious attitude, and was anxious to stand on equal terms with the other teachers. When communicating with higher representatives of the Board of Education he felt extremely uneasy. He was overconscientious in every respect, was constantly afraid of making a mistake, of committing a *faux pas,* or of offending somebody. In short, there was an unsolved conflict between his modern and progressive views and his secret attachment to tradition and authority. He always cast furtive glances at imposing figures of old men. After this interpretation he was equally freed from his symptoms for a long while.

Now, why did these quite different and even contradictory interpretations produce the same beneficial effect on this man? The neurotic, confused and scared by his apparently senseless symptoms and his irrational behavior, will be relieved by every plausible explanation of his complaints. The mere realization that his weird symptoms are accessible to a rational interpretation, is apt to bring relief and comfort. The common human trend to establish causalities is satisfied. Epecially the compulsion neurotic, who is driven by a constant urge to ask questions, to raise problems and to express scruples and doubts, is put at ease when the therapist brings logical order into his disorder, irrespective of the method applied. Every dynamic psychotherapy tries to make him understand the intricate ways of human imagination and human emotions, and to divest the neurotic ritual of its mystery and threat.

Our singular conclusions are the more debatable as they are necessarily based on a selected material. Man's associations are largely determined by his actual state of mind. A depressed person will produce only negative and painful recollections. The same individual, when in a better condition, may recall positive and friendly events.

A high-school girl with epilepsy and fluctuating moods was encouraged to do some painting every day. When thumbing through her diary, one could easily see her ups and downs: during her gloomy periods she painted horror pictures in black and grey, hardly any other color, while her cheerful days were characterized by lovely paintings in bright and gay colors. During her menstruation red was dominant. Twice she pictured herself: Once lying naked on a steel spring with sharp spikes, another time she was lying in a colorful dress on a comfortable couch, the hand of the therapist resting on her forehead.

The basic mood of the neurotic is pessimistic. He has an especially faithful memory for unpleasant experiences. He is a seasoned collector of failures and disappointments, of situations in which he was wronged, curtailed or rejected. He is hardly ever able to forgive, never able to forget.

The magic power of the past over man, and especially over the neurotic, manifests itself in various ways. A study of the dreams of our patients often yields valuable material in this respect. Freud's technique of dream analysis as well as Jung's contributions help us to a quicker and deeper understanding of the patient's background, his motives and phantasies. If we subject the dreams of our patients to a thorough discussion, we are able to shorten the psychotherapeutic process. We will learn how early experiences, impressions and suggestions, early acquired defense mechanisms and prejudices remain highly significant for the whole fashioning of the later life. They may be the source of insecurity, restlessness and resentment, and, in times of crises, break through with irrational reactions, not only in the life of the individual, but also in the history of nations. Of course, early ex-

periences may also prove to be a source of strength in trying situations:

When Faust, resolved to end his life, sets the cup of poison to his lips, it is the sudden sound of the Eastern choral which evokes pleasant childhood memories and calls him back to life. Although he had abandoned all religious faith, this recollection exercises a strong emotional appeal:

"And *Memory* holds me now, with childish feeling,
Back from the last, the solemn way.
Sound on, ye hymns of Heaven, sweet and mild,
My tears gush forth: The Earth takes back her child."

However, the etiological significance of recovered memories is often overrated. Recollections from childhood have not necessarily the pathogenic weight and the traumatic character which are often attributed to them. They may not be the cause of the neurosis, but solely reveal how this individual, already as a child, used to behave and to react according to his temperament, character and environment.

A young married woman who had developed an agarophobia one year ago, felt especially ashamed of her fear complex, because she had always prided herself on being a fearless, independent girl, who used to go out alone and to travel by herself. Her earliest memory disclosed her genuine desire to be grown-up and self-reliant. She recollected a scene at the age of three, when she was sitting in a rocking chair pretending to read a newspaper. Her present neurosis had developed, when after her husband's return from the army, her independence was threatened.

Childhood memories are often interesting mainly in so far as they reveal basic attitudes of the patient and throw light on the present situation.

PART II.

In psychotherapy, the actual problems and present conflicts should not be neglected for searching in the past. The conscious life of man is still an essential part of his existence; his conscious thoughts and real actions mirror his personality. Besides, the frontiers between Conscious and Unconscious are not definite. Some so-called unconscious material is merely momentarily non-conscious. Men know more than they know they know. If we focus our attention on the actual situation and study our patient's utterances intensively, the essential problem with its underlying motives will be brought to light. This procedure demands a great deal of concentration. Training in concentration has even a healthy effect of its own. Concentrated introspection is fundamentally employed in meditation and contemplation of the Christian Mystic and in the Indian Yoga system. By concentrating the patient on the therapeutic procedure, we detach him from the trivial concerns of his daily life and strengthen his power of resistance.

A great help for the patient is provided by the simple opportunity of talking about himself, of getting things "off his chest." Self-expression and abreaction are encouraged in every form of psychotherapy. Verbalizing one's trouble alone, however, has only restricted curative value. The therapist's task consists of directing the discussion to the essential problems, and not to permit any superficial and vague remarks, evasions and half-truths. Everybody knows how annoying it is when our patients, instead of voicing their problems in simple and genuine language, talk in preconceived psychological terms, taken from books on psychology they may have read. I have in mind a 17 year old girl who wanted something done about her nail biting, and started the interview by saying: "To begin with, doc, I am not an orgastic type." There is a good point in the recently elaborated system of General Semantics which emphasizes the importance of a clear and correct wording in the process of personal adjustment, and considers the careless, irrelevant and vague remarks of people in quandary the cause rather than the result of their confusion.

The situation of the patient freely airing his grievances in front of an attentive listener has been compared with the constellation in the confessional. However, the doctor-patient relationship is on a more equal level, and the scientific, rational and unprejudiced approach in psychotherapy is in strong contrast to the mystic implication and dogmatic postulate of religion. The patient in the doctor's office does not expect relief from his suffering by an authoritative verdict and a remission of sins, but by an objective and unbiased study of his conflicts and miscon-

ceptions from a psychological point of view. His own revision and re-evaluation of his apprehensions, guilt-feelings and doubts clear the way to inner redemption.

Another factor is effective in every psychotherapy: In *relating* his story to the therapist the patient establishes a *relationship* with the physician. This relationship has a significant emotional tinge. Freud has introduced the term "transference" in order to indicate that in his opinion the emotional attachment which the patient develops toward his psychotherapist—devotion, sympathy and love as well as resistance and hatred—do not originate in the current situation, but represent solely an act of repetition of his earlier affection towards his parents, and that the patient simply "transfers" his repressed libido to the analyst in order to evade an objective facing of the real issue. This interpretation of the emotional attitude of the patient as purely a projection of the past into the present situation (a "shadow play of childhood") is the less convincing as Freud also recognizes the "counter-transference" on the part of the physician, for which it would be difficult to find a similar analogy in childhood.

The patient's attachment to the therapist is easily understood as a genuine emotional response to the unique situation. A sensitive, lonely and discouraged patient finds interest, understanding, approval and comfort. All his problems are taken seriously and treated with sympathy. In confidential talks very intimate things are discussed, erotic and sexual problems touched, and the patient is not only permitted, but encouraged to detach himself from conventional restrictions. Enthusiasm over the inspiring procedure and a simple feeling of gratitude are also apt to evoke devotion and affection. On the other hand, his dependence on the therapist makes him sensitive towards any sign of neglect on the part of the physician, and he easily reacts with resistance or jealousy.

However, not every objection or criticism of the patient is necessarily "resistance" or "escape"; it may be a well founded and valid disagreement. The therapist, on his part, is in the situation of everybody who takes a sincere interest in another individual's personal life. One hardly can really *take care* of somebody without in the end *caring for* him. We unnecessarily hurt the feelings of our patients by contesting the genuineness of their affection and by denouncing it as a neurotic trick. We should respect his feeling as a true experience of its own value, and help him to overcome the resulting conflict. It is interesting to note that Alexander and French now discriminate between "transference neurosis" in the old sense, which they declare as not always necessary and sometimes even undesirable, and "transference cure," i.e. an adequate reaction of the patient to the actual personality of the therapist.

At any rate, all psychotherapists agree that the emotional attitude of the patient is an important factor in the therapeutic process. Without love, reasoning has no weight and arguments are of no avail. Only in an atmosphere of sympathy and confidence will the patient be prepared to relinquish his neurosis and to correct his conduct. In simplifying we may say that, at first, the patient gives up his symptoms for the sake of the doctor. Then the crucial point arrives when it will be determined whether he finds more gratification in his newly gained a-neurotic behavior and will adhere to it, although he has to renounce the attachment to the therapist, or will relapse into his neurosis.

The more the treatment advances, the greater emphasis must be laid on the achievement of a *synthesis*. Synthetic trends are inherent in almost every stage of therapy, except in the very beginning, when sympathetic listening and a general approval of the patient as a suffering person, prevail. However, as soon as we attempt to detach the patient from his individual self-centered seclusion and point to common experiences, to social considerations and general principles, we appeal to synthetic forces. As soon as we make him understand that he is too much preoccupied with his own problems and takes himself too seriously, and whenever we tend to lead his self-love, resentment and aggressiveness into constructive channels, we try to replace his sterile situation by a productive and creative attitude.

In spite of our intensive occupation with the personal concerns of our patient, we fight an untiring struggle against his egotism, his prejudices and susceptibilities, his ignorance, inertia and cowardice. It is true, many of our neurotics are idealists, perfectionists and over-conscientious objectors. With due respect for their moral attitude we have to bring home to them a better understanding of reality. The patient must grow out of his weaknesses, correct his frozen patterns, and mature. Maturity means willingness to be honest with oneself, and preparedness to give as well as to receive, to develop social concern, devotion and tolerance. It comprises the capacity to size things up, to discriminate between essential and unessential issues, to stick to principles, but to be ready to compromise in minor questions. If the patient learns to realize his limitations without developing a sense of frustration, and to look at his own affairs with a sense of humor, then he will be safe.

This aim of bringing the patient's problems into the right perspective, of relieving his tensions, allaying his fears and restoring his self-confidence, is common to all psychotherapeutic methods.

Every method has its merits, its limitations, and its special indications. The choice of method should not be determined by the doctrine of a special school but by the individuality of the patient and the nature of his neurosis. Therefore, the psychotherapist should master all methods in order to adjust his procedure to the individual case. In some instances, particularly in functional disturbances of the internal organs, simultaneous administration of drugs is often justified. However, the patient should be made to understand that this support by medication does not contradict our basic concept of the psychoneurotic nature of his disorder, but that we merely want to ease the battleground in order to fight more effectively.

Common to all psychotherapeutic methods is the *basic personal attitude* required of the therapist. The psychoanalytic school demands that every psychoanalyst undergo a training analysis in order to become aware of his complexes and not to be hampered by blind spots when he encounters his own unrecognized difficulties in the patient. I do not believe that this is always necessary. There is even some danger involved that the candidate's outlook is narrowed into a dogmatic and one-sided view, thus creating another form of scotoma. If Freud would have been analyzed, he never would have discovered psychoanalysis. However, every psychotherapist should feel the obligation of a constant and rigorous self-analysis of his own life, his motives, actions and reactions.

One of my patients remarked: "If you want to help me, you must be more devilish than my devil." Indeed, in psychotherapy we must be vigilant, conversant and resourceful, in order to catch the patient's complexes and to discover his sophisms and subterfuges. Whatever method of treatment is applied, the fundamental attitude of every psychotherapist is clearly defined: He must be detached yet receptive, unemotional yet interested, understanding yet critical, placid yet observant, firm but not dominating, self-asserting yet modest, and above all, patient.

Experimental Catalepsy in the Rat Produced by a Steroid Hormone:

Desoxycorticosterone Acetate, and the Antagonistic Effect of Pentamethylenetetrazol (Metrazol)

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Selye[1] reported the production of deep anesthesia in rats and mice following intraperitoneal injections of large doses of steroid hormones. Fourteen steroid compounds were tested and deep anesthesia was induced by six (desoxycorticosterone acetate, progesterone, androsterone, testosterone, methyltestosterone and diethylstilbestrol). It was observed that only hormonally active steroids proved to exert an anesthetic effect even though the activity was not limited to compounds with any one specific type of hormonal action. Partially hepatectomized rats were found to be much more sensitive to the anesthetic effect of the steroids than intact controls. Female rats appeared more sensitive than males.

Selye continued this work, making a number of subsequent reports. Using the anesthetic effect of the steroids as an indicator of their activity, he brought out the fact[2] that these hormones are normally detoxified in the liver. He made numerous correlations between the chemical structure of a large number of steroids and their pharmacological action in the rat.[3] With Heard,[4] he demonstrated their anesthetic potency in the redfin minnow. He also showed[5] that anesthesia could be produced by oral administration of the hormones to partially hepatectomized rats.

These findings suggested to the writer the possibility of producing experimental catalepsy in the rat, either by keeping the dose of administered hormone below that necessary to induce deep anesthesia, or by accurate observation of the preanesthetic and postanesthetic periods keeping in mind the picture of experimental catalepsy produced by other agents.

METHOD

The exeriments were performed on twenty-four immature female albino rats of about 40 to 60 grams in weight. The material used was desoxycorticosterone acetate in oil (5 milligrams per c.c.). Injections were made intraperitoneally in amounts varying from 0.1 c.c (0.5 mg.) to 4 c.c. (20 mg.). Protocols were kept, recording the behavior of the animals at frequent intervals Deep anesthesia was induced in many of the rats, close attention being paid to the activity of the animal before this state was complete and after it began to diminish. In some cases it was possible to induce the cataleptic state without the production of deep anesthesia. Photographs were taken to demonstrate the anesthesia and the catalepsy. Aside from the usual criteria of immobility and the maintenance of imposed awkward postures in a setting of wakefulness, two specific tests were applied to establish the existence of the cataleptic state: (1) The forelimbs were placed on a small cardboard carton and the hindlimbs on another. The cartons were gradually drawn farther apart from each other during which time the rat made no effort to escape from this situation; (2) The animal was placed on the side of the cage in which position it would hang, firmly grasping the wire screening, making no effort to change its position. These two tests, it was believed, served to differentiate catalepsy from anesthesia, the anesthetized rats failing to react in the manner described, lying limp and motionless, eyes closed, and in an unconscious state; the cataleptic rats remained immobile but with open eyes and with an awareness of their surroundings, responding positively to the tests.

In later experiments, once the cataleptic state had been fully established, pentamethylenetetrazol (metrazol) was injected intraperitoneally in the dose of 0.2 c.c. of a 10 percent solution in order to determine its ability to abolish the cataleptic condition.

RESULTS

In the immature female albino rat, doses of from 2 to 5 milligrams of desoxycorticosterone acetate in oil solution, injected intraperitoneally, will induce deep anesthesia in from 30 to 60 minutes following the time of injection. This is preceded and followed by a cataleptic state characterized by wakefulness, with eyes open and corneal reflexes preserved, but with inability to correct imposed awkward postures. Before catalepsy is established and as it subsides there is marked incoordination associated with any effort at locomotion. The following protocol demonstrates a characteristic observation:

6-6-44	Weight 37 grams.
8.08 P.M.	1 c.c. of desoxycorticosterone acetate in oil (5 mg. per c.c.) injected intraperitoneally. 5 mg.
8.17 P.M.	Lies in separate corner of cage instead of huddling close to litter mates.
8.20 P.M.	Eyes half shut.
8.27 P.M.	Cannot walk. Awake. Eyes open. Permits hyperextension of all extremities and placement of tail in any position. Occasional short jerky movements.
8.33 P.M.	When turned on back makes feeble attempt to right itself.
8.43 P.M.	Opens eyes when handled. Keeps them open but does not move. Closes eyes in one minute.
8.45 P.M.	Deep anesthesia.
8.50 P.M.	Deep anesthesia. Photograph taken (Fig. 1).
9.20 P.M.	Deep anesthesia.
10.38 P.M.	Deep anesthesia.
11.34 P.M.	Deep anesthesia.
11.43 P.M.	Slight spontaneous movement. Still anesthetic.
11.48 P.M.	Eyes half open. Several movements of jaw. Opens eyes widely when handled. Extremities and tail maintain imposed positions.
11.50 P.M.	When undisturbed, lies quietly, eyes half open, does not attempt to move, assumes posture last imposed on it by worker.
11.53 P.M.	Opens eyes widely when blown upon sharply. Maintains awkward postures without moving although it starts with some alarm at the unexpected gust of wind.
11.57 P.M.	Can be turned on back, although apparently not asleep.
12.07 A.M.	When placed over food dish makes a few movements as if eating, but takes no food.
12.10 A.M.	More alert. Moves jaws rapidly. Stretches. Rubs face with paw several times. Eyes wide open. Still cataleptic.
12.24 A.M.	Rat suspended over food pan, hindlimbs extended, eyes open, not eating.
12.34 A.M.	Can be lifted up by tail, raising hindlimbs but not forelimbs from ground, with no protest.
12.45 A.M.	Serial observation terminated. Rat still cataleptic.
9.00 A.M.	Rat fully recovered.

It will be noted that the preanesthetic period of catalepsy was relatively short while the postanesthetic catalepsy was prolonged. This reaction was uniform in all of the animals that went into a state of deep anesthesia. Fig. 1 shows the picture of deep anesthesia in which complete loss of consciousness is evident.

In some cases it was possible to produce the cataleptic state without the reaction progressing to deep anesthesia. The following protocol illustrates this condition:

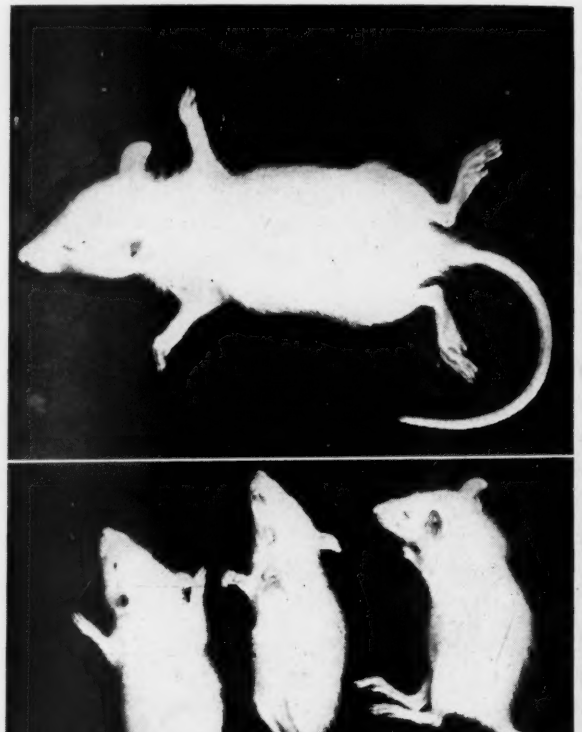

Fig. 1. Steroid anesthesia.

8-24-44	Weight 52 grams.
6.28 P.M.	0.5 c.c. of desoxycorticosterone acetate in oil (5 mg. per c.c.) injected intraperitoneally. 2.5 mg.
6.37 P.M.	Slight incoordination. Less active.
6.40 P.M.	Incoordination rapidly increasing. Eyes open.
6.42 P.M.	Marked incoordination and unsteady gait when movement is attempted.
6.51 P.M.	Cataleptic. Eyes open.
7.08 P.M.	Still cataleptic. Able to cling to side of cage for one minute when so placed, but unable to move.
7.18 P.M.	No change. Photographs taken (Fig. 2).
7.25 P.M.	Rights itself when turned on back. Otherwise completely cataleptic. Will remain on back when so placed in worker's hand. Extremities rigid.
7.40 P.M.	Makes two unsteady steps forward, spontaneously.
7.45 P.M.	Jumps when cage is jarred. No other movements.
8.00 P.M.	Slight increase in activity. Beginning to make slow unsteady efforts to move about.
8.05 P.M.	No longer maintains imposed postures. Able to move about in cage, still in unsteady manner.
8.11 P.M.	Eating from food pan. Shows better ability to balance itself.
8.15 P.M.	Recovered. Running about in cage.

Here, then, is the production of the cataleptic state without any corresponding anesthesia. This experiment was repeated in several other animals, although one cannot definitely predict on the basis of the ratio of drug administered to the weight of the rat which animal would develop catalepsy without anesthesia. Fig. 2 illustrates the cataleptic response as seen in the animals either in experiments such as the one just cited, or occurring before or after anesthesia. There is no difference in the cataleptic response in relation to the presence or absence of anesthesia during the experiment.

Selye[6] was able to interrupt deep anesthesia in the rat to whom steroid hormones had been administered, by the injection of pentamethylenetetrazol (metrazol). It seemed proper, therefore, to see if the cataleptic condition induced by desoxycorticosterone acetate could be abolished by the same agent. Experiments along this line indicated that steroid catalepsy can be abolished by pentamethylenetetrazol. The following protocol illustrates the reaction:

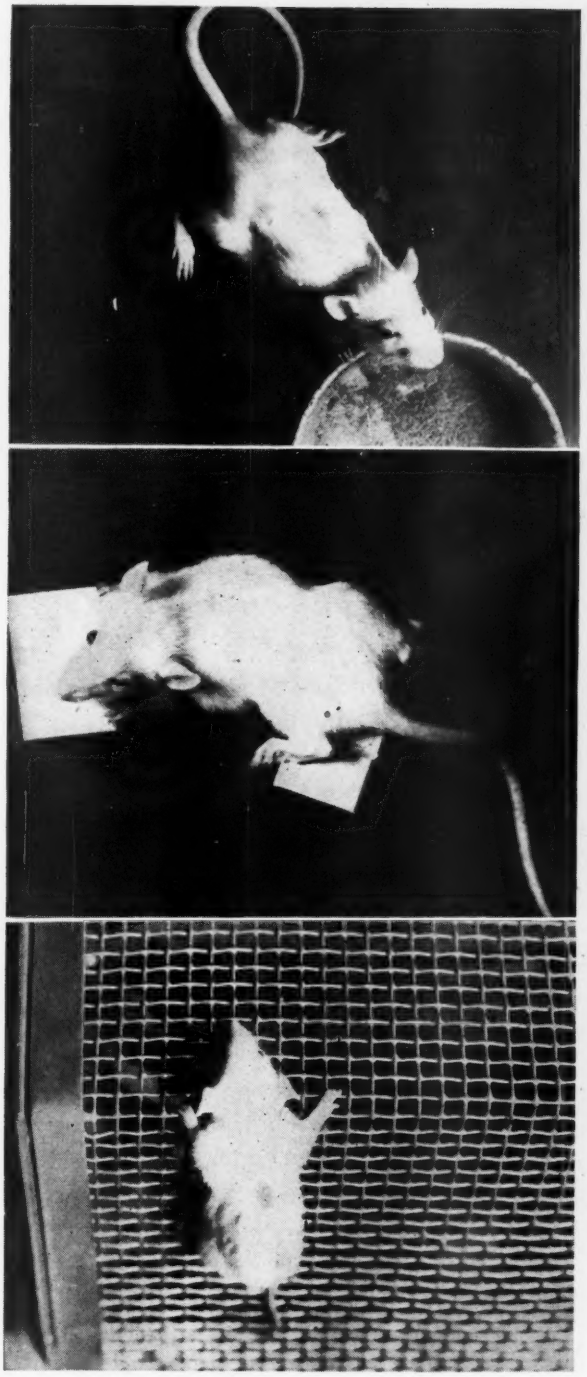

Fig. 2. Steroid catalepsy.

9-5-44	Weight 62 grams.
8.02 P.M.	2 c.c. of desoxycorticosterone acetate in oil (5 mg. per c.c.) injected intraperitoneally. 10 mg.
8.10 P.M.	Slight incoordination observed. Animal walking about in cage.
8.27 P.M.	Marked incoordination now present.
8.33 P.M.	Maintains imposed postures. Hangs from side of cage. Corneal reflex present.
8.39 P.M.	Cataleptic. Preserves awkward postures imposed on it. 0.2 c.c. of 10 percent solution of pentamethylenetetrazol in-

jected intraperitoneally. In 20 seconds animal rights itself. Convulsive jerks noted. Active movements of forelimbs.

8.43 P.M. Violent convusions.

8.44 P.M. Strong jerky movements. Moves clumsily with interspersed convulsive movements. Some difficulty in controlling hindlimbs.

8.46 P.M. Bites at probe. No longer maintains imposed positions.

8.47 P.M. Lying still when undisturbed. No cataleptic symptoms.

8.48 P.M. Spontaneously runs about cage.

8.49 P.M. Increasingly overactive. Thrashes about cage in violent, but not convulsive, manner. Coordination is good.

8.54 P.M. Still wildly overactive, thrashing about cage, heedlessly running against walls.

8.56 P.M. Suddenly quieter, breathing rapidly.

9.02 P.M. Cataleptic again. Will hang from side of cage when so placed and shows other manifestations of catalepsy.

COMMENT

Experimental catalepsy has been produced by a number of chemical agents, the best known being bulbocapnine, of which much has been written. Other substances that produce this state are insulin,[7] adrenalin,[8] mescaline,[8] hordenine,[8] acetylcholine[8] and deuterium oxide.[9] Experimental catalepsy has also been produced by the formation of an artificial ileus,[10] starvation,[11] reduction of atmospheric pressure,[12] ligation of the hepatic artery,[13] partial asphyxia with carbon dioxide or nitrogen[14] and by the surgical production of brain lesions.[15] In this diverse group of procedures it is indeed difficult to find an explanation for the catalepsy that would be common to all.

The addition of desoxycorticosterone acetate to the group sheds no further light on the question of the disordered physiologic processes underlying the cataleptic state. The laboratory finding is presented as an empiric fact.

Kennedy[16] noted that metrazol greatly increased the cataleptic component of the state produced by bulbocapnine. The opposite is true concerning the effect of metrazol on steroid catalepsy.

It is tempting to speculate about the correlation between steroid catalepsy and clinical catatonia. Articles such as those by Gildea and Man[17] and by S. Stenberg[18] indicate that there is some derangement in the steroid metabolism of psychotic patients. In view of the fact that these patients are frequently benefited by convulsive therapy, one might draw an analogy between the clinical response to metrazol and the antagonizing effect of that chemical on steroid catalepsy. Such discussion, however, could not be supported by any conclusive corroborative data. The author recognizes the fact that the dose of steroid hormone used in these experiments is large and therefore the catalepsy described in this paper probably presents no parallel to any existent psychiatric condition.

SUMMARY

Desoxycorticosterone acetate injected intraperitoneally in large doses in immature female white rats produces a state of experimental catalepsy. This may be observed to occur either alone or in association with deep anesthesia. In the latter case, the catalepsy precedes and follows the period of anesthesia. The intraperitoneal injection of pentamethylenetetrazol (metrazol) antagonizes the cataleptic effect of the steroid hormone.

2338 EUTAW PLACE.

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REFERENCES

1. Selye, H.: Anesthetic effect of steroid hormones. *Proc. Soc. Exper. Biol. & Med.* 46: 116-121 (Jan.) 1941.
2. Selye, H.: On the role of the liver in the detoxification of steroid hormones and artificial estrogens. *J. Pharmacol. & Exper. Therap.* 71: 236-238 (Mar.) 1941.
3. Selye, H.: Correlations between the chemical structure and the pharmacological actions of the steroids. *Endocrinology* 30: 437-453 (Mar.) 1942.
4. Selye, M. & Heard, R. D. H.: The fish assay for the anesthetic effect of the steroids. *Anesthesiology* 4: 36-47 (Jan.) 1943.
5. Selye, H.: The anesthetic effect of orally administered steroids. *Anesth. & Analg.* 22: 105-109 (Mar.-Apr.) 1943.
6. Selye, H.: The antagonism between anesthetic steroid hormones and pentamethylenetetrazol (metrazol). *J. Lab. & Clin. Med.* 27: 1051-1053, 1942.
7. Divry and Evrard: *J. Belge de Neurol. et de Psychiat.* 37: 382, 1937.

8. DeJong: Proc. Roy. Acad. *Amster.* 34: 576, 1931.
9. Herrmann, J. B.: The pharmacological action of deuterim oxide Action on the central nervous system. *J. Pharmacol. & Exper. Therap.* 67: 265-275, 1939.
10. Nieuwenhuyzen: Proc. Roy. Acad. *Amster.* 38: 332, 1935.
11. Nieuwenhuyzen: Acta brev. neerl. *Physiol.* 4: 90, 1934.
12. Jongbloed: Arch. neerl. *Physiol.* 19: 538, 1934.
13. Geesink: Acta brev. neerl. *Physiol.* 6: 72, 1936.
14. DeJong: Acta brev. neerl. *Physiol.* 1: 99, 1931.
15. Ingram, Barris and Ranson: *Arch. Neurol. & Phychiat.* 35: 1175, 1936.
16. Kennedy, A.: Effect of cardiazol on so-called "bulbocapnine catatonia" in monkeys. *J. Neurol. & Psychiat.* 2: 115-124 (Apr.) 1939.
17. Gildea, E. F. & Man, E. B.: Methods of estimating capacity for recovery in patients with manic-depressive and schizophrenic psychoses. *Am. J. Psychiat.* 99: 496-506 (Jan.) 1943.
18. Stenberg, S.: Psychosis and blood lipoids: quantitative variations of total cholesterin and total fatty acids in the clood in dementia praecox. *Acta med. Scandinav.* 72: 1, 1929.

Work the "Last Bastion" Engulfed in Neurosis

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Every neurosis, like a sponge, absorbs psychic energy, otherwise located at normal depositories. The typical sequence of events is that hobbies, previously enjoyed, become meaningless. The mood deteriorates; depression, dissatisfaction and inner insecurity become visible. The emotional life becomes concentrated on neurotic worries; various symptoms including lack of sexual interest are evidenced. However, the mechanical ability to work is preserved. Very rarely does the acute stage of a neurosis start with inability to work. Of course the enjoyment of work, originality of ideas in work, are impaired at the highpoint of a neurosis. The basic ability to work is preserved much longer. Work is the last fortress taken over by neurosis. The questions arise, why does that situation typically occur; how can exceptions from that sequence of events be explained.

In discussing the problem of work one must distinguish between *enforced* and *self-chosen* trades or professions. There is a difference between the son entering his father's business without enthusiasm, simply because it "makes sense," and the man who "always" wanted to become a mechanical engineer, supporting himself through school, making great sacrifices to achieve his goal. The unconscious reason for the second type is analytically clear; although not aware of it, the self-chosen profession satisfies in sublimated form unconscious defense mechanisms, covering deep inner desires. Hence work of that type is more pleasurable.

For the majority of people work represents a drudgery necessary to earn a livelihood. There are not many people for whom work is also "fun." The majority consider work a necessary evil, like taxes.

Work plays a decisive role in the psychic economy; it is the normal depository of inner guilt. It may sound fantastic but it corresponds to clinical facts that everybody has a good sized amount of "that stuff," as an indignant patient called it. By paying ransom in form of work, the typical person pays his debt to his inner conscience. The punitive quality of work makes it a necessity. The connotation of work as punishment is analytically a well known phenomenon, intuitively known to mankind since time immemorial. In Genesis Adam and Eve, expelled from Paradise, were required to work as punishment.

There is a strange incongruity visible when working ability deteriorates neurotically: *the more pleasurable work has been at "normal" times, the quicker is it absorbed in the neurotic process.* Indifferent work is maintained longer because of the punitive quality.

There may be a further reason for the

preservation of working ability in neurosis. Paradoxically, it may be stated that the unconscious is well aware of the fact that neurotic pleasures imbedded in neurosis have the quality of a game. And games do not extend too far. A comparison of two cases may help clarify these points.

Mr. A., a writer of distinction, developed a writing block at the age of 39. He had previously published numerous books, the last one reaching the best-seller list, although it was not appreciated by the author himself. After the initial elation of success, he became moody. He no longer enjoyed transitory affairs with women of his acquaintance; everything seemed boring. He attempted a new novel, but made little headway. He took a long trip and discovered to his dismay that he could not write any more. He became despondent, thought seriously of suicide by drowning. Finally he entered analysis.

Mr. B., a lawyer of 45, entered analysis because of a marital conflict. He was not interested in his wife and was pressed by an illicit girl-friend to marry her. He could not decide what to do and figured out a good excuse. By entering analysis, he "immobilized" his girl friend informing her that analysis required suspension of vital decisions until the unconscious reasons were clarified. His real reason for entering treatment was quite different. The man was a gambler, concentrating his interests on cards. The legal profession never meant much to him as he had studied law at the urging of his family to enter his uncle's office. He did his work mechanically, was "neither good nor bad," as he expressed it, in his profession. He lived for years in a queer excitement, his "life for the day" started at the card table. Still he was capable of fulfilling his professional duties. During the last weeks before entering analysis, he felt depressed, attributed his state of mind to the conflicts "the women" made and to the fact that he lost continuously in poker. The gambling addiction did not seem pathologic to him; like all gamblers, he believed that he needed more money and luck, not a psychiatrist. One day, in court, he was about to make some motion in behalf of his client, caught himself in the last second, realizing that the move was too dangerous. Said the patient: "At that moment I really became frightened. I discovered that I was transplanting my gambling instincts to my profession."

Cases A and B are examples of a free-chosen and enforced profession. Working ability collapsed very quickly in the case of the writer, very late in the case of the lawyer, demonstrating the earlier statement that there is a direct connection in the collapse of working ability in neurosis depending on the amount of pleasure provided from the work in "quiet" times. In his vocation the writer used unconscious defense mechanisms corresponding to unconscious pleasures, the lawyer used his work only for making a living. Only at a late stage of the game did the latter project his neurotic conflict into his profession.

The writer fought intrapsychially with a deep passive-masochistic wish to be mistreated, rejected, humiliated. That tendency, corresponding to the end result of his specific infantile conflict, was passed off as defense with the opposite tendency—pseudo-aggression. In his novels he placed a strong he-man in the center of the action. He overdid his defensive efforts and was criticized by reviewers that his characters were lifeless and unreal. In his last successful novel he made his hero more human. He paid for that humanization with a severe inner reproach. A step further and the defensive cover approached the real unconscious situation. Interestingly enough, that inner danger was so great that not even the external success could be used as an alibi to his inner tribunal. Whereas he used previously his pseudo-aggressive heroes as "proof" that he was not "weak" and masochistic, the defense collapsed and his inner conscience rejected the old alibi causing the writing block. The man did not represent his unconscious wishes in his last work, as previously. The sequence of events in his working process was: first, fight against inner conflicts, second, rational aim of making money.

The lawyer-gambler had a completely different approach to his work. Work was not

to solve inner conflicts. It was originally only a means of earning a living. His inner conflicts were deposited in his gambling. Ironically, it could be said that his real profession was that of a gambler. In his gambling he fought a never-ending battle for maintaining infantile megalomania. He behaved as if he could order the winning card. That tendency of clinging to infantile ideas of grandeur is possible only in gamblers as a condition of accepting punishment. Infantile megalomania is normally supplanted by the reality principle. That bitter pill is administered by educational authorities: mother, father, teachers, etc. Hence clinging to the original megalomaniacal tendency becomes a punishable offense. If the old wish emerges, the counteraction of guilt is promoted at the same time. Normally, that threat is sufficient to force the child to accept the fact that one cannot always do what one pleases. The gambler uses a specific technique in holding on to infantile omnipotence: he "acts" omnipotence, accepts the punishment in form of an unconscious wish to lose—every gambler loses in the long run—libidinizes his defeats by "enjoying" unconsciously psychic masochism. Even in defeat, he must prove to himself that he is aggressive and not masochistic. By unconsciously identifying the opponent or the impersonal gambling machine with authorities of his childhood, he reduces them aggressively to absurdity as giving persons. That leads once more to a strengthening of the unconscious wish to lose. This sort of gratification reminds one of the tale of the farmer's wife who disputed with her husband as to the best method of cutting garden flowers. She insisted upon shears and he preferred a knife. In the end the man drowned his wife in a near-by stream, and she, in the very act of drowning made a triumphant, scissors-like gesture with her fingers.

The sequence of events in the gambler-lawyer, as far as the disposition of his inner conflicts was concerned, was as follows: Work was at first a rational act of making money and more or less free of neurotic admixtures. His whole bundle of inner conflicts was deposited in his gambling. Late in life, at the time his neurosis increased the radius of operations (every neurosis increases as time passes by) his previously untouched part of working ability was drawn into the sphere of inner conflict.

Work satisfies not only rational factors but unconsciously also reverberations of the triad of aggressive, libidinous, and narcissistic tendencies. (Freud.) In free chosen and enforced occupations the amount of emotional elements varies: it dominates in the former, is, for long time, negligible in the latter. In both types punitive unconscious elements are present. Under neurotic stress, work in freely chosen occupations collapses early because of the original emotional involvement, whereas in indifferent occupations working ability is the last to give way. The punitive element embedded in work makes it more resistant and less "eligible" for attacks stemming from the punitive inner conscience.

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REFERENCES

Freud, S.: "Civilization And Its Discontent." *Ges. Schr.* XIII, p. 46.

Knopf, O. and Bergler, E.: A Test For The Differential Diagnosis Between Retirement Neurosis And Accident Neurosis. *J. of Nerv. and Ment. Disease* 100: 366-380, 1944.

Bergler, E.: On A Five-Layer-Structure In Sublimation. *Psychoanal. Quart.* XIV: 76-97, 1945.

Bergler E.: On A Clinical Approach To The Psychoanalysis Of Writers. *Psychoanal. Review* 31: 40-70, 1944.

Bergler, E.: Psychopathology Of Pseudo-Humbugs And Pseudo-Bluffers. *Psychiat. Quart. Supp.* 201: 14-22, 1946.

Bergler, E.: The Gambler—A Misunderstood Neurotic. *J. of Crim. Psychopath.* IV: 379-393, 1943.

Bergler, E.: Unhappy Marriage And Divorce. *Int. Universities Press,* New York, 1946.

Bergler, E.: The Battle Of The Conscience. *Wash. Inst. of Med.* 1947.

Insulin Therapy at Colorado Psychopathic Hospital

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Insulin shock therapy is utilized primarily at this hospital in the treatment of schizophrenia. Statistically, the schizophrenic reactions constituted numerically the largest group of admissions annually. In 1944, an illustrative year, out of a total of 480 psychotic reactions admitted, 154 were classified as schizophrenia. From 1944 through 1946, one hundred fifty-eight patients out of 166 receiving insulin therapy were diagnosed as schizophrenic reaction types. An investigative review of all of these cases, with emphasis on the schizophrenic types, is presented.

DIAGNOSTIC GROUPINGS AND SELECTION

Of the 158 schizophrenic reaction types given insulin therapy there were 89 paranoid, 27 mixed, 24 catatonic, 15 hebephrenic and 3 simple; 112 had been ill less than one year. In 3 cases the duration of the illness could not be ascertained. Selection of the patients for insulin therapy was dependent principally upon the basis of the inverse ration between the duration of the illness and recovery.

Eight non-schizophrenic patients were also given insulin therapy. Of these, showing improvement were 4 manic-depressive psychoses, 2 severe psychoneuroses, and 1 paranoid state. A paranoid state with manic-depressive features exhibited no improvement on combined electroshock-insulin therapy.

RESULT EVALUATION

Within the limitations peculiar to this hospital, results of insulin therapy of the schizophrenic reactions can be evaluated. Generally, our permitted maximum hospitalization period may not exceed three months. With disposition, the patient goes home or to another hospital, usually Pueblo State Hospital.

Therapy Results

Type	Total Number	*Improved Number	Percent Improved	Unimproved	Relapses within two years
Paranoid	89	68	76.4	21	14
Mixed	27	22	81.4	5	3
Catatonic	24	21	87.4	3	2
Hebephrenic	15	10	66.6	5	5
Simple	3	2	66.6	1	1
Totals	158	123		35	25
Percentage	100	78		22	20.3

*Improvement indicates the ability of the patient to leave the hospital.

As noted above, the best results were obtained in the sequence of catatonic, mixed and paranoid types. Basically, this is in accord with the overwhelming statistical findings of Ross and Malzberg.[1] Cheney and Clow[2] are of the opinion, however, that the paranoid schizophrenics benefit the most. As early as 1938, Frostig[3] expressed the view that even though the large number of relapses was disturbing, it should not be a deterrent against insulin therapy. Solomon,[4] Bond and Rivers[5] further strengthen this attitude by stressing the increased recovery rate, shorter hospitalization time, and better quality of remission.

BASIC AND ADJUNCTIVE THERAPY

Adjunctive therapy must be considered in the "over-all" picture. Thirty-five had previous or later electroshock therapy during the same episode. Four had combined insulin-electroshock. One case received an insulin-metrazol combination. This mixed therapy will of necessity, color the results. The psychotherapeutic role cannot be evaluated. Some form of psychotherapy will result in any hospital regime. However, with the lack of medical personnel during the war, adequate psychotherapy must of necessity, have been neglected. Without insight from psychotherapy, a preponderance of relapses is to be expected in the ensuing five year period.

Our figure of 78% improvement is higher

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than the usual statistical figures available. In 1939, reviewing 1039 cases treated in the State Hospitals of New York, Ross[6] found that 65.4% showed some degree of improvement; whereas in the untreated control series only 22.1% showed any degree of improvement. In a two year follow-up of the same cases, only 45.4% continued to show improvement. In our two year follow-up, 57.7% maintained their existence outside the hospital. Of our patients 112 had been ill less than one year and a mixed therapeutic diet had been utilized in 40 cases, hence these factors may have spiked our improvement percentage. Ross and Malzberg,[1] as well as Cheney and Clow,[2] agree that there is an inverse ratio between the duration of the illness and recovery. Exception is taken by Frostig[3] who emphasized that this principle loses its validity in cases of over 2 years' duration.

HOSPITALIZATION RECORD

Of the cases treated 62 had been previously hospitalized, 17 having had prior insulin and 2 prior metrazol therapy. For 104 patients, it was a primary admission. The occurrence of hospitalization was as follows: two, 42; three, 16; and four, 4. Twenty-two patients were forwarded to Pueblo State Hospital of whom 10 had had two or more hospitalizations. Harris,[7] Chase and Silverman[8] are of the opinion that previous attacks are usually considered a favorable prognostic sign, if the patient made a good adjustment during the remission, and if therapy is applied soon after the onset of the new attack.

SEX PROGNOSTICATION

No support is found in the literature regarding the assumption that better results are obtained in males. Ross,[6] Malzberg,[9] Cheney and Clow[2] maintain that viewpoint. Gralnick[10] is of the opinion that women respond better to treatment than men. In our 158 series, 71 were males and 87 were females. Our improvement score was 78.8% for males and 77% for females. Hence, our findings do not substantiate any prognostic superiority in treatment results.

AGE PROGNOSTICATION

In general, therapists favor the age group from 15-40 as the most favorable for insulin shock therapy. In the older age groups, the observations are conflicting. The age past 40 is deemed undesirable by Chase and Silverman.[8] Selectively, Cheney and Clow[2] prefer the age group below 30. The mean age range in our series was 32. The oldest was 60 and the youngest 11.

The seven patients between 50 and 60 improved, and only one (non-schizophrenic) required transfer to Pueblo. The latter developed a complication of mild intermittent clonic convulsive seizures for 48 hours and was treated successfully with phenobarbital. The routine two hour hypoglycemic coma was utilized with the coma dose ranging from 35-190 units. Just one grand mal epileptic was precipitated. It is the writer's opinion that age alone is no contraindication to insulin therapy.

THERAPY PROCEDURE

In this series, the averages of insulin injections was 40, dosage 165, and hypoglycemic comas 29. Gralnick[10] *et al.* think that the results of therapy bear no constant relationship to the amount of shock dose of insulin given, to duration of treatment, or the number of comas. They believe that good remissions can be obtained with as little as 15 to 20 treatments and few, if any, comas. Only three of our cases, excluding the subshock group of six, were terminated with less than 20 insulin injections exclusive of a therapeutic complication factor. It is remarkable that all on subshock insulin improved, namely: one psychoneurotic, mixed, severe and three hebephrenic, one paranoid, and one catatonic schizophrenia. In the individual patient the greatest number of insulin injections totalled 139 and the highest number of comas obtained was 59. Insulin coma dosage ranged from 35 to 340 units intramuscularly, rarely intravenously.

WAIVER OF PHYSICAL CONSIDERATIONS

Certain physical abnormalities were evaluated prior to instituting insulin shock therapy. A boy, age 11 (refused by Pueblo Hospital because of his age), with recurrent

active rheumatic heart disease diagnosed as schizophrenia, hebephrenic type, expired after having had 139 injections and 32 comas during a two year stay. Because of destructive, combative behavior this therapy was necessary. A coarctation of the aorta, a recent acute duodenal ulcer, and a prior acute rheumatic fever episode without organic sequelae in individual cases offered no special difficulties during a course of insulin.

STANDARD COMPLICATIONS

Occurrence of fatalities in insulin shock is rare. Kolb and Vogel[11] in a survey of 305 mental hospitals reported a death rate of .85%. In our 166 cases, two deaths for a death rate of 1.20% which corresponds approximately with Malzberg's[9] statistics of 1.29%. Many of the usual complications transpired. There were two compression fractures, one transitory cardiac arrhythmia, four prolonged comas, two urticarial reactions, two post insulin excitements, and one left transitory hemiplegia. Of interest is the fact that Billig and Sullivan[12] successfully utilized prolonged coma in insulin shock treatment of schizophrenics in whom previous shock therapies had been unsuccessful; to them, the complication is the desired reaction.

RARE COMPLICATIONS

Two subarachnoid hemorrhages, one duodenal ulcer, and two hepatic dysfunctions were intercurrent unusual phenomena. A total literary anemia was noted in regard to the two latter complications. The ulcer occurred after eleven insulin injections and was confirmed by positive occult blood in the stool as well as roentgen ray evidence. Temporary cessation of insulin therapy and a sippy dietary regime for three weeks, permitted continuance. After 61 insulin injections, therapy was again stopped because of clinical signs of hepatic disorder. This was manifested by fever absence, severe jaundice of three weeks' duration, icterus index of 75, tender hepatomegaly, and an immediate direct van den Bergh reaction. A clinical impression of transitory jaundice on an hepatic basis was formulated for another case but no laboratory confirmation was obtained. Freed and Wofford[13] reported one case of subarachnoid hemorrhage in 1938 and stated that no similar case was found in the literature. As in their case, our two cases of subarachnoid hemorrhage, ages 36 and 20, also recovered. Bloody spinal fluid and the neurological findings were presumptive diagnostic evidence. It is probable that the insulin served only as a contributory factor in the appearance of the duodenal ulcer, hepatic dysfunctions and subarachnoid hemorrhages, but speculative curiosity is stimulated.

EPILEPTIC GRAND MAL SEIZURES

Investigators are ambivalent as to whether grand mal epileptic seizures should be considered as complications or desirable phenomena. Within our two hour hypoglycemic coma range, we consider grand mal seizures as neither, but rather as a feature of routine insulin shock. There is no reliable method for provoking or preventing an insulin convulsion. The occurrence of these attacks shows no correlation with the dose or type of insulin, age, sex, or condition of the patient. Malzberg[9] on the basis of large statistics asserts that spontaneous epileptic convulsions have no therapeutic significance. Our evaluation confirms this. Out of 158 schizophrenics, 64 showed one or more grand mal seizures during course of therapy. Total seizures amounted to 216. The highest number of grand mal seizures obtained in an individual were 11. Twenty cases showed no improvement, although their seizures varied from 1 to 8.

INSULIN THERAPY FOR SCHIZOPHRENIA

(S.O.P.—Standard Operating Procedure)

As early as 1938, Dussik[14] indicated that schizophrenia should be treated with insulin as soon as possible after the diagnosis was ascertained. This is still a very worthwhile consideration, as we have no absolute prognostic signs, and the result cannot be postulated. Perhaps now the combined insulin-convulsive therapy should, in many instances, be advocated to open the way for psychotherapy and insight establishment. Of course, improvement may occur without effecting insight.

Chapuis and Georgi[15] present results that

indicate the superiority of the combined treatment. Meduna[16] adheres to the belief that any effective means of treating schizophrenia must interfere with some phase of the carbohydrate metabolism. Braceland[17] *et al.* have stressed the presence of the anti-insulin factor and the diabetic-like tolerance in active schizophrenia. Gellhorn[18] believes that every successful treatment of schizophrenia produces stimulation of the sympathetic-adrenal system. In our opinion, emotional activity during psychotherapeutic interviews can cause similar physiological functioning. Shock therapy will, in many cases, be the opening wedge for the psychotherapeutic relationship, and the emotional activity can then be directed to the patient's greatest possible benefit.

SUMMARY

1. Schizophrenic reactions constitute numerically the largest group of annual admissions.

2. Approximately one-third of all schizophrenic reactions admitted to the Colorado Psychopathic Hospital the past three years received insulin therapy.

3. 78% of the 158 schizophrenic reactions so treated were able to leave the hospital.

4. The best results obtained in sequence were catatonic, mixed and paranoid types.

5. Combined insulin-convulsive therapy, indicative of present day psychiatric trends, occurred in 40 cases.

6. Age alone is no contraindication to insulin shock therapy.

7. Rare complications noted include two subarachnoid hemorrhages, two hepatic dysfynctions and one duodenal ulcer.

8. Grand mal epileptic seizures is considered a normal manifestation during the routine hypoglycemic coma period.

9. The group therapeutic significance of grand mal seizures are nil.

10. Psychotherapy, with its emotional connotations, may function physiologically on the same basis as insulin and is necessary for lasting benefit.

REFERENCES

1. Ross, J. R. and Malzberg, B.: A Review of the Pharmacological Shock Therapy and the Metrazol Convulsive Therapy in New York State; *Am. J. Psychiat.* 96: 297, 1939.
2. Cheney, C. O. and Clow, H. E.: Prognostic Factors in Insulin Shock Therapy; *Am. J. Psychiat.* 97: 1029, 1941.
3. Frostig, J. P.: Experiences with the Insulin Therapy in Schizophrenia with Special References to Clinical Problems; *Am. J. Phychiat.* 94 (Supp.) 220, 1938.
4. Solomon, H. C.: Shock Therapies (insulin and electric) in Psychiatry; *Clinics* 4: 555, Aug. 1945.
5. Bond, E. D. and Rivers, T. D.: Insulin Shock Therapy After Seven Years; *Am. J. Psychiat.* 101: 62, 1944.
6. Ross, J. R. *et al.*: The Pharmacological Shock Treatment of Schizophrenia; *Am. J. Psychiat.* 97: 1007, 1941.
7. Harris, M.: Insulin Sensitivity of Patients with Mental Disease; *Arch. Neurol. and Psychiat.* 48: 761, 1942.
8. Chase, L. S. and Silverman, S.: Prognostic Criteria in Schizophrenia; *Am. J. Psychiat.* 98: 360, 1941.
9. Malzberg, B.: Outcome of Insulin Treatment of One Thousand Patients with Dementia Praecox; *Psychiat. Quart.* 12: 528, 1938.
10. Gralnick, A.: Insulin Sensitivity of Patients with Mental Disease; *Arch. Neurol. and Psychiat.* 48: 761, 1942.
11. Kolb, L. and Vogel, V. A.: The Use of Shock Therapy in 305 Mental Hospitals; *Am. J. Psychiat.* 99: 90, 1942.
12. Billig, D. and Sullivan, D. J.: Therapeutic Value of Protracted Insulin Shock; *Psychiat. Quart.* 16: 549, 1942.
13. Freed, H. and Wofford, C. W.: Subarachnoid Hemorrhage During Shock Therapy for Schizophrenia; *Arch. Neurol. and Psychiat.* 39: 813, 1938.
14. Dussik, K. T.: 3½ Years of Hypoglycemic Therapy of Schizophrenia Results and Problems; *Am. J. Psychiat.* 94: 269, 1938.
15. Chapuis, R. and Georgi, F.: Traitements de Choc dans les Depressions et les Schizophrenics Schweiz; *Arch. F. Neurol. U. Psychiat.* 15: 66, 1945.
16. Meduna, L. J.: Common Factors in Shock Therapies; *Dis. Nerv. System* 6: 283, Sept. 1945.
17. Braceland, F. J., Meduna, L. J. and Vaichulis, J. A.: Delayed Action of Insulin in Schizophrenia; *Am. J. Psychiat.* 102: 108, July 1945.
18. Gellhorn, E.: Affects of Hypoglycemia and Anoxia on the Central Nervous System; *Arch. Neurol. and Psychiat.* 40: 1, 125, July 1938.

A Note on the Dynamics of Suicide

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Tendencies toward suicide present a problem which we as psychiatrists continuously face in our practice, but which we seem to avoid in our thinking, research and writing. The bare statistics are profoundly disturbing: in the United States alone there are more deaths from suicide yearly (22,000) than from all infectious diseases combined, and of each 1,000 births, at least 10 males and 3 females are doomed to self-destruction. These figures are official, but no one knows the incidence of unsuccessful attempts, nor how many deaths by suicide are attributed to other causes.

Undoubtedly, the cultural milieu is important: predominantly throughout Islam and Judeo-Christianity suicide is a legal crime as well as a moral sin, whereas the Buddhist may approve the release of the soul from the unclean flesh and the fanatic Japanese Shintoist may consider hara-kari the culturally correct and supremely heroic protest or sacrifice. Further, as Bunzel,[1] Dublin,[2] Durkheim[3] and others have found, many ancillary factors play a role, for instance: race (negroes ⅓ the rate for whites), age (increasing incidence with advancing years), sex (3 times as frequent in men), place (urban rate 1½ times the rural), economic status (highest among the wealthy and poor, lowest in middle classes), geography (most frequent in coastal and mountainous regions) and even the weather (highest in spring, lowest in winter). Certainly, all such factors are important from an actuarial standpoint; and yet, because we as physicians want to prevent suicides rather than count them afterward, we are interested less in statistics than in the poignantly personal problems of our patients. Suicide therefore remains for us a highly important theoretical and practical issue in the dynamics of individual behavior.

In this connection, Freud's "death instinct" theory merits some consideration, partly because it still has a number of adherents among present-day psychoanalysts (e.g. Menninger,[8] Sterba[9]). As you know, in certain of his later writings Freud[4,5] thought it necessary to modify his original theory that human behavior is motivated to secure pleasure and avoid pain ("pleasure-pain principle") in order to account for the phenomena of apparently unbiologic aggressivity, masochism, and self-destruction. He therefore proposed that all instincts be dichotomized into those of Eros, representing survival and procreation, as opposed to a universal Thanatos or death-instinct, composed of primal aggressivity which, when "turned inward," led to catabolic processes, senescence and inevitable death by self-destruction. Freud himself proposed this only as a theoretical departure in metapsychology, and not as an incontrovertible dogma; moreover, in later years, he and other early analysts seem to have abandoned this field of speculation. Perhaps this occurred because further clinical experience demonstrated that masochism is not *intrinsically* self-punitive or destructive, but rather a pattern of behavior in which deep satisfactions and the attainment of unconsciously desired goals far outweigh the superficial pain endured (Masserman[6]). Thus, the flagellante shreds his back not because he likes the suffering *per se,* but because flagellation and even death by self-torture is a small price to pay for the eternal joys of a martyr's heaven that will, he believes, most certainly be his due. This concept has been partially confirmed in our own laboratory by the induction of so-called experimental masochism in animals as a behavior pattern designed to secure rewards attained in the organism's earlier experiences even when these rewards are no longer forthcoming (Masserman[7]).

And yet this recrudescence of the pleasure-pain principle at a deeper level of symbolism, motivational economics and covert expectation would hardly, at first sight, ex-

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plain the ultimate act of self-destruction by suicide. To complete the formulation we must go back to a psycho-philosophic concept which was already old at the time of Hobbes and Berkely: namely, that no one can adequately conceive what he himself has not actually lived through. True, we can imagine a transparent fire-breathing dragon, but even this never-never creature is only a combination of animated glass, winged lizard and belching locomotive—all configurations in our own experience.

Lest we seem to be wandering afield, let me come to the point: none of us has experienced death, and none of us, despite our protestations to the contrary, can really imagine absolute and final non-being for ourselves. Oblivion to pain, yes; prolonged, restful sleep with ultimate awakening, yes; utter nullity, no! And as we grow older, the most hard-headed of us (*vide* Jeans, Eddington, Lodge *et al.*) incline wishfully to a belief in the immortality either of the flesh or the spirit, since the concept of absolute death is fundamentally inconceivable. And as we analyze the unconscious sources of the fantasies of a potential suicide, the more clearly it appears that physical death to him may offer an escape from an unendurable earthly existence—possible to the Nirvana-like peace of the womb or the tomb—yet the indestructible hope remains that the immortal "I" will continue to exist in some form or other. And in this sense all of us—not merely the one in 50 who will execute the act—are at the deepest psychological levels, potential suicides should our earthly frustrations and conflicts become unbearably great. The psychobiologic paradox is thus resolved: we kill not to die, but wishfully to live. Unfortunately, the high incidence of suicide bears mute witness to the tragic consequences of this transcendent delusion.

REFERENCES

1. Bunzel, Bessie: Suicide. Encyclopedia of the Social Sciences. *Macmillan Co.,* New York, 1942. Vol. 13, pp. 455-459.
2. Dublin, L. I. and Bunzel, Bessie: To Be or Not to Be; a Study of Suicide. *Smith and Haas,* New York, 1933.
3. Durkheim, E.: Le suicide. Paris, 1930.
4. Freud, S.: Civilization and Its Discontents. *Cope and Smith,* New York, 1930.
5. Freud, S.: Beyond the Pleasure Principle. *Int. Psychoan. Press,* London, 1932.
6. Masserman, J. H.: Principles of Dynamic Psychiatry. *W. B. Saunders Co.,* Philadelphia, 1946.
7. Masserman, J. H.: Experimental Masochism. Motion Picture Film. *Psychological Cinema Register,* State College, Pennsylvania, 1947.
8. Menninger, K. A.: Man Against Himself. *Harcourt, Brace & Co.,* New York, 1938.
9. Sterba, E. S.: The Psychopathology of Manic Depressive Disorder and Involutional Melancholia. *Brit. J. M. Psychol.,* 22:20, 1944.

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